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SUBJECT: Review of DOE Seismic Evaluation Procedure

The DOE Seismic Evaluation Procedure (SEP), whose final version is dated November 11, 1996 (and including a series of revisions made through early March, 1997), has been reviewed by the team of reviewers that you constituted specially for this purpose. The team includes Robert J. Budnitz, Robert P. Kennedy, and Loring A. Wyllie Jr. The expertise of the team covers the disciplines of systems analysis and regulatory issues (Budnitz), and seismic and structural engineering (Kennedy and Wyllie). Although all three team members examined the whole report, the individual team reviewers concentrated their efforts in their fields of expertise.

Preliminary drafts of the SEP were reviewed over the past year, at a meeting in July 1996, and then through the autumn. Another draft developed recently was reviewed at a meeting that took place on November 22, 1996 at Palo Alto, CA. All three members of the review team were present, along with the principal authors, Stanley C. Sommer and Robert C. Murray of LLNL. Comments from that meeting were then incorporated into the final version which has since been forwarded to our team and with which we concur. This means that all of our technical concerns with previous drafts have now been resolved.

Our review comments are three in number:

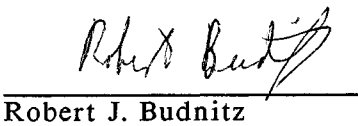
1) We strongly endorse the use of the SEP procedures by DOE for seismic evaluations of existing facilities.

2) The basis for much of the SEP is the SQUG (Seismic Qualification Utility Group) seismic-review procedures developed for nuclear power plants and endorsed by the NRC, with heavy multi-year involvement by an independent review body, the Senior Seismic Review and Advisory Panel (SSRAP) and by an initially skeptical NRC. However, the scope of the SQUG guidance does not cover all of the safety-relevant equipment in DOE facilities, so DOE has developed several extensions to evaluate additional equipment categories. We believe that these extensions, that allow experience-based evaluation by rules in lieu of rigorous analysis or testing, are the single most cost-effective way to maximize the seismic-safety benefits achieved for any given cost expenditure. Therefore, we strongly support the extensions in the SEP to the additional equipment categories contained in the current document.

However, it must be recognized that these extensions have not undergone the same degree of review and consensus-building as the SQUG procedures for nuclear power plants, which involved a multi-year, very costly process. We believe it important to point out that the DOE extensions have been reviewed by two of the five original SSRAP members (Kennedy and Wyllie) but the level of review has been much less than they expended on the SQUG procedures. Also, no regulatory body has been involved here that is comparable to NRC. While we are not convinced that such a costly and in-depth review is necessary, it is important to note that the pedigree of the DOE extensions is not similar to that of the SQUG procedures.

3) We also support the cautious extension of these experience-based seismic evaluation methods to the design and evaluation of new equipment, if the areas of application are carefully selected. In fact, we believe that this approach can be at least as effective, and in some important areas can be an improvement over NRC's Standard Review Plan sections for many categories of equipment. Designing new facilities for improved earthquake performance can best be achieved by providing sufficient anchorage, bracing, and ductile details rather than through principal reliance on extensive and expensive dynamic analysis.

The three of us wish to thank you for the opportunity to have participated in reviewing this important project. With warmest regards,



Robert J. Budnitz
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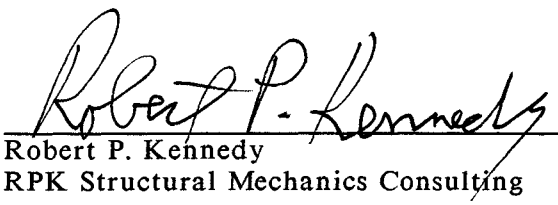

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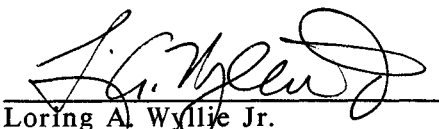

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